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ABSTRACT

Frequently assigned tasks performed by qualified respiratory therapy personnel are delineated in the document in such a manner that proficiency examinations within the profession can be prepared from them. Four distinct proficiency levels are identified and defined. Due to the fact that proficiency examinations will be assigned for them, proficiency levels two and three are described in greater detail, with information provided regarding the clinical and background knowledge required and appropriate clinical skills necessary for each level. The delineation of roles and functions include: experienced level one personnel, equipment maintenance and repair, and clerical duties; entry level two personnel, intermittent positive pressure breathing, humidity/aerosol therapy, gas therapy, pulmonary draingage procedures, cardiopulmonary resuscitation, cardiorespiratory drug administration, and infection control; entry level three personnel, continuous ventilation (standard and special procedures), airway care (tracheobronchial aspiration and tracheostomy care), emergency care, infection control, cardiorespiratory pharmacology, pulmonary function testing, and cardiorespiratory rehabilitation; and level four personnel, managerial skills, formal/academic respiratory therapy, heart-lung bypass, and cardiopulmonary pediatrics. An official definition of respiratory therapy and a glossary of terms used in the document are appended. The document is supplemented by A Guide for Respiratory Therapy Curriculum Design (CE 005 956). (LH)

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FINAL REPORT

NATIONAL INSTITUTES OF HEALTH

CONTRACT 72-4219

DELINEATION OF ROLES AND FUNCTIONS OF RESPIRATORY THERAPY PERSONNEL

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
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ED116030

FINAL REPORT

DELINEATION OF ROLES AND FUNCTIONS OF RESPIRATORY THERAPY PERSONNEL

July 31, 1973

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FOR

DIVISION OF ALLIED HEALTH MANPOWER
BUREAU OF HEALTH MANPOWER EDUCATION
NATIONAL INSTITUTES OF HEALTH,
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BETHESDA, MARYLAND

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FOREWORD

This publication was prepared by the American Association for Respiratory Therapy pursuant to National Institutes of Health Contract Number 72-4219 with the NIH Bureau of Health Manpower Education. The contents of this document were developed on the basis of Advisory Committee suggestions, contributions by technical consultants and input from the respiratory therapy profession.

As stipulated in the contract, an Advisory Committee was selected from respiratory therapy personnel, hospital administrators, medical specialists and representatives of federal agencies to review and analyze work by the project staff.

It is important to emphasis that individuals who expect this report to be an exhaustive statement of the utilization of respiratory therapy personnel possibly will find that it does not meet this expectation. It has been prepared solely for the guidance of those responsible for the subsequent development of proficiency examinations, who themselves are experienced in the respiratory therapy profession.

The Association is confident that additional resource material and documents will be developed from this work which will more fully state the implications for education in respiratory therapy. Further implications may include the utilization of respiratory therapy personnel in modes not currently receiving widespread acceptance. This may include the continued professional development of respiratory therapy personnel who have mastered all that is set forth in this document.

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PROJECT OVERVIEW

In accordance with the American Association for Respiratory Therapy's contract with the Bureau of Health Manpower Education, National Institutes of Health, the primary purpose of this document is to delineate actual and appropriate roles and functions of respiratory therapy personnel in such a manner that proficiency examinations can be prepared for at least two levels within the profession.

Moreover, this report includes detailed statements of knowledge and skills required for an individual to competently perform designated tasks within respiratory therapy at the appropriate level.

Although the expressed purpose of this document is for test development, a guide for educational curriculum design for use by educators in respiratory therapy will be developed based on material in this document and from additional information to be gathered from professional agencies and resource groups. (A detailed SCOPE OF WORK for this project is included in the Appendix).

It has been established that proficiency tests for respiratory therapy should determine whether one satisfies minimal requisite knowledge and skills required for recognition of proficiency at a given level. To this end, it is not necessary nor desirable to specify in this report all the duties and responsibilities that may or should be assigned to respiratory therapy personnel. Hence, this document delineates only those frequently assigned tasks which are performed by qualified respiratory therapy personnel.

The detailed task listings included in the subsequent sections were prepared by the project staff and modified according to input by the Advisory Committee and professional consultants. The resulting list formed the basis of the detailed statements of knowledge and skill presented in this document. The task lists were also used as a guide to develop and categorize roles and functions of respiratory therapy personnel at significant levels according to the degree of difficulty. Special attention was given to amount of knowledge and depth of clinical experience required prior to performance of a task. From this sequential analysis, four distinct proficiency levels were identified and delineated. Proficiency examinations were deemed appropriate for two of these Levels, which consequently are described in considerable detail.

IDENTIFICATION AND DISCUSSION OF COMPETENCY LEVELS

The roles and functions of respiratory therapy personnel include a spectrum of tasks which range from those requiring limited knowledge, little or no clinical skills and minimal contact with critical patients to those taxing the abilities of the most knowledgeable and experienced clinician.

The wide range of competency necessary to perform respiratory therapy tasks led to the identification of four distinct levels of proficiency in the field. The determination of levels was based on the amount and type of knowledge and skills expected, the work situations under which they must be applied, the amount of supervision needed, the degree of independent judgment required and the amount and type of patient contact.

Since the successful completion of a task in a competent manner often involves more than knowledge or skill, a third dimension, "depth of experience," was added as a basis upon which clinical judgment is most frequently established.

For the purpose of this report the term "Level" is defined as a relative position of competency or general rank of achievement. It is used in this document to supplement designations previously attendant with standard nomenclature such as technicians, therapists, technologists, and so forth.

Level I is defined as the beginning level in respiratory therapy. Individuals with no formal training or experience in respiratory therapy may be employed at this level. Therefore, it follows that a proficiency examination for entry into Level I is not appropriate.

Level IV, although not completely delineated in this report, was projected to include individuals with responsibility for teaching, administration, research and/or advanced clinical techniques. Since many of the tasks delineated at Level IV are not commonly practiced, there are currently no plans for a proficiency test at this level.

The delineation of tasks for Levels II and III are presented more formally and in more detail than those for Levels I and IV, since it is these middle levels for which proficiency examinations will be designed. For Levels II and III, this report presents a narrative description of the *Clinical Knowledge* required and a brief assessment of the *Background Knowledge* required for the competent execution of the tasks or *Clinical Skills* appropriate for each level.

The term *Clinical Knowledge*, as used in this report implies the body of facts, principles and basic information one needs to know to apply, operate, or service cardiorespiratory equipment and administer drugs and therapy procedures. The accumulation of this knowledge can be acquired thru participation in formal study or on-the job experience.

Background Knowledge is more broad in its meaning and incorporates the total body of facts one accumulates through study, training and experience in nonclinical situations. Within the context of this report, *Background Knowledge* implies the resourceful use of arts and sciences learned prior to clinical performance. It provides a foundation upon which clinical capabilities are developed and complements and supplements *Clinical Knowledge*.

Clinical Skills, as delineated in this report, are tasks and observations related to the care and treatment of patients. The listing of a particular skill in this document designates it as a minimum requirement for competency at that level.

Since it was assumed that only experienced individuals will use this material to develop proficiency examinations, the narrative description presented as *Clinical Knowledge* and *Background Knowledge* were meant to serve as a general guide depicting the degree of knowledge and skill required to carry out respiratory therapy procedures at a designated level. Therefore, a proficiency test for a particular level should deal exclusively with knowledge and skills required of a person upon ENTRY into the level. For this reason, task statements and *Clinical Skills* within the narrative list only the tasks that might be performed by an individual, and therefore is not inclusive of all tasks that may be performed as an individual gains additional knowledge, skills and experience.

The above criteria were utilized to delineate roles and functions of respiratory therapy personnel with attention directed to minimal standards necessary for competent performance at Levels II and III.

Some indication as to the relative importance of tasks, knowledge and skills may be gained through one's sensitivity to the language used to describe the need for each component as it appears in the narrative. Actual task delineations were grouped according to modality rather than subject matter, i.e. intermittent positive pressure breathing, humidity aerosol therapy, etc., v.s. pulmonary physiology, bacteriology and so forth.

DEFINITION OF LEVELS

Level I personnel are primarily trained on-the-job and are equipment oriented. Their job requires little independent judgment, no experience in respiratory therapy prior to employment, and limited, if any, patient contact. Level I tasks are delineated for an "experienced" individual, i.e., one who has mastered knowledge and skills necessary to function in an advanced state prior to becoming a Level II.

The roles and functions delineated for Levels II and III are those currently applied in the daily treatment of patients by respiratory therapy personnel. An individual at these levels frequently perform the stated tasks and should be competent in the areas delineated. It is emphasized that the word "competent" used in this context means minimal knowledge, skill and experience required in order to accomplish the task safely and effectively. A complete statement of the minimal roles and functions of Levels II and III personnel can be obtained by referring to each sections which concisely identify minimal knowledge and skill at a level. It should be understood that a Level II may appropriately perform Level III functions under the direct supervision of a Level III, and that some (but not all) of Level III functions commonly will be performed by experienced Level IIs.

Level IV tasks require a high degree of knowledge, skill, clinical experience and unsupervised contact with critical patients in situations requiring great individual judgment. Level IV tasks and responsibilities represent a form of vertical mobility within the profession for highly proficient respiratory therapy personnel. These roles and functions have been identified as contemporarily relevant to respiratory therapy and are included along with related career mobility concepts in compliance with conditions of the contract.

DELINEATION OF ROLES AND FUNCTIONS OF EXPERIENCED LEVEL I PERSONNEL

EXPERIENCED LEVEL I PERSONNEL

Requirements for entry at Level I are knowledge of reading, writing and verbal communications skills in the dominant language and the physical and mental capability to perform work assignments effectively with and without direct supervision. Generally, these tasks are related to equipment service and maintenance, although some clerical and errand duties are required. Situations utilizing independent judgment are limited and usually defined by established departmental procedures. Work assignments require recall of basic facts and the following of written and verbal instructions with minimal direct patient contact.

As Level I acquires training and experience he may, under supervision, be assigned additional special functions which are similar to those performed by entry Level II personnel. In this respect, on-the-job training and experience can assist in the preparation for advancement to a higher proficiency level.

A. EQUIPMENT MAINTENANCE AND REPAIR

The Level I is trained to maintain respiratory therapy equipment including cylinder and liquid gas supply. This function involves cleaning, sterilization, preventative maintenance, basic repairs and servicing of operating therapy equipment. This does not include life support equipment in hospital areas such as intensive care.

An area of performance that is broad in scope, yet relegated to Level I is the dispersion of equipment to patient care areas. This includes periodic check rounds and the collection and return of discontinued equipment to the department for service. Moreover, in emergency and other special situations, assistance by the Level I to those operating therapy equipment would be provided as requested.

Clinical Knowledge

An experienced Level I can disassemble, clean, sterilize, reassemble and test respiratory therapy equipment for operation. He transports equipment to patient units, periodically re-checks equipment and performs necessary service to keep it functioning safely and effectively. In isolation cases, he would observe necessary precautions when delivering and picking up used equipment. In all cases, the Level I follows good personal hygiene and hospital aseptic techniques to prevent the spread of infection.

Gas cylinders and bulk gas systems are handled according to hospital and other regulatory codes. In the event of a hospital emergency, the Level I acts according to departmental procedure. Should a patient emergency occur, he is qualified to carry out independent resuscitation as described by the American Heart Association for lay persons.

Clinical Skills

1) Clean, repair, sterilize and maintain equipment such as respirators, flowmeters, humidifiers, nebulizers, tents, hoods, etc.

2) Deliver equipment to patient unit.

3) Prepare and test equipment for safe operation.

4) Follow and enforce safety rules.

5) Follow special instructions such as isolation precautions.

6) Periodically check equipment for operation and routine service.

7) Upon termination of therapy, return equipment to the department.

Background Knowledge

The experienced Level I must have knowledge of basic medical terminology, reading skills, high school biology or its equivalent, physican science and basic microbiology.

B. CLERICAL DUTIES

The experienced Level I performs clerical duties such as answering the telephone and accurately recording requests for therapy. Equipment rounds should be made and records of equipment location and use will be kept. He is able to inventory equipment and supplies. Other clerical duties may include collecting and recording daily service charges.

Clinical Knowledge

The Level I receives and records treatment service requests. He processes each request according to departmental policy and will refer any emergency requests to his supervisor. He makes service rounds and collects equipment requisitions and charges. To function effectively, the Level I must establish rapport with other members of the staff, assist them as requested and learn departmental routine including the types of equipment and service available.

Clinical Skills

1) Receive and record telephone requests for service.

2) Process orders.

3) Complete clerical work.

4) Notify treatment personnel to start therapy.

5) Collect and complete patient billing.

Background Knowledge

The knowledge required of an experienced Level I is arithmetic, reading skills, medical terminology and telephone communication techniques.

DELINEATION OF ROLES AND FUNCTIONS OF ENTRY LEVEL II PERSONNEL

ENTRY LEVEL II PERSONNEL

The Level II must be proficient in Level I tasks. He administers respiratory therapy to all patients except those requiring intensive care. The immediate supervisor is usually a Level III, or a Level II with several years of clinical experience.

In the fulfillment of Level II duties, the following respiratory therapy modalities are performed: intermittent positive pressure breathing (IPPB), humidity/aerosol therapy, medical gas administration, pulmonary drainage procedures and cardiopulmonary resuscitation.

A Level II must be able to administer aerosolized drugs most frequently prescribed by physicians. Cardiopulmonary drug administration relates to antibiotics, bronchodilators, enzymes, mucolytics, steriods, wettings agents and antifomants.

He must also be able to implement infection control and have knowledge of aseptic techniques such as isolation procedures and the handling of contaminated equipment.

In addition, where expedient, he may carry out Level III tasks under the direct supervision of an experienced Level III. Such tasks may include treatment of patients within critical care units.

A. INTERMITTENT POSITIVE PRESSURE BREATHIING

Clinical Knowledge

An understanding of the application of ventilators to patients in providing intermittent positive pressure breathing is requisite. The Level II administering IPPB must be aware of the indications, contraindications and hazards involved. Also, he must have the ability to recognize an adverse patient response and take corrective action. A knowledge of ventilators commonly used to provide intermittent positive pressure breathing treatments including the preparation and testing of the ventilators prior to applying it to the patient is required.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Prepare/retest IPPB machine.

3) Prepare/position patient.

4) Add prescribed medication.

5) Adjust controls.

6) Implement IPPB treatment.

7) Instruct patient to clear airway.

8) Assess tidal volume.

9) Assess patient responses.

10) Modify technique to deal with adverse patient response.

11) Recheck equipment.

12) Record therapy.

General Knowledge

The Level II administering intermittent positive pressure breathing should have a knowledge of basic mathematics and the general concepts involved in fundamental acid-base chemistry and physics pertaining to gas flow. He should also have a knowledge of anatomy and physiology of the respiratory system and basic understanding of the pathology and pathophysiology of respiratory diseases.

B. HUMIDITY/AEROSOL THERAPY

Clinical Knowledge

The Level II will have an understanding of nebulization, atomization and humidification. He must be able to identify indications for humidifying inspired gases. He must have a knowledge of the application of aerosols in the treatment of bronchopulmonary diseases. Basic understanding of the principles and properties of aerosols is necessary as well as knowledge of the indications, contraindications and hazards of aerosol therapy. It is imperative that a competent Level II recognize adverse patient response to aerosol therapy.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select equipment.

3) Prepare/retest equipment.

4) Add prescribed medication.

5) Prepare/position patient.

6) Implement therapy.

7) Assess patient response.

8) Modify technique to deal with adverse patient response.

9) Maintain equipment.

10) Record therapy.

General Knowledge

The areas of knowledge required include: elementary medical physics, basic mathematics, pharmacology of aerosolized drugs, anatomy and physiology of the respiratory system, elementary chemistry and a basic understanding of pathology and pathophysiology of respiratory diseases.

C. GAS THERAPY

Clinical Knowledge

The Level II should have knowledge of the physical and chemical characteristics of medical gases. He should be aware of the clinical signs of hypoxia and indications, contraindications and hazards of medical gas administration. A basic knowledge of respiratory diseases and their complications that require oxygen therapy and other types of medical gas mixtures is necessary. He should be familiar with the equipment used to administer and monitor medical gases such as cannulae, masks, hoods, enclosures and so forth, and have an understanding of safety procedures of medical gas administration. He should have the ability to assemble and pretest the medical gas administering equipment. In addition, he should recognize adverse patient responses to therapy.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Prepare/retest equipment.

3) Prepare/position patient.

4) Observe safety procedures.

5) Implement therapy.

6) Assess patient res

7) Modify technique to deal with adverse patient response.

8) Record therapy.

General Knowledge

The Level II administering medical gases must have knowledge of basic mathematics, fundamental concepts of chemistry and basic understanding of respiratory physiology, pathology and pathophysiology of respiratory diseases. He should understand the physics of gas flow.

D. PULMONARY DRAINAGE PROCEDURES

Clinical Knowledge

The Level II must have knowledge of the indications, contraindications and hazards involved with the pulmonary drainage procedures. He should be capable of performing pulmonary drainage procedures, and must effectively use equipment such as vibrators, percussors, suction machines and oxygen therapy devices. It is critical that the capable Level II be able to identify hazards encountered in the performance of pulmonary drainage procedures. He must be able to instruct the patient and family in pulmonary drainage procedures, cough instruction, airway maintenance and in the care of respiratory therapy equipment used in the home.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Prepare/position patient.

3) Implement pulmonary drainage procedures.

4) Percuss or vibrate patient.

5) Assess patient response.

6) Modify techniques to deal with adverse patient response.

7) Collect sputum specimens.

8) Record procedures.

General Knowledge

To function safely and effectively, a Level II must have knowledge of segmental anatomy of the lung, pathology and pathophysiology of respiratory diseases, basic medical physics and fundamental microbiology.

E. CARDIOPULMONARY RESUSCITATION

Clinical Knowledge

Clinical knowledge required includes recognition of cardiorespiratory failure and arrest, techniques of airway clearance and maintenance, techniques of manual cardiopulmonary resuscitation and evaluation of resuscitative efforts. Individual initiative should be limited to identifying the problem, summoning help and selecting and providing the best method of resuscitation.

Clinical Skills

1) Recognize signs of cardiopulmonary embarrassment/arrest.

2) Position patient for cardiopulmonary resuscitation.

3) Clear and maintain patient airway.

4) Ventilate patient using mouth-to-mouth or other techniques.

5) Initiate external cardiac compression.

6) Evaluate effectiveness of resuscitation.

7) Record resuscitation attempt.

General Knowledge

The general knowledge required to perform these procedures includes human anatomy, physiology, pathology and pathophysiology of cardiopulmonary diseases. Other knowledge required incorporates topographical anatomy of the head, neck and thorax and basic physiologic concepts relating to pulmonary ventilation. Also, physics as applied to operation of mechanical valves and related movement of gas through obstructed and restricted passages should be understood. A knowledge of the anatomy of the heart and cardiovascular system is essential.

F. CARDIORESPIRATORY DRUG ADMINISTRATION

Clinical Knowledge

To be proficient in using drugs, the Level II must be able to read and interpret a physician's order; operate all types of nebulizers; accurately compute, draw and administer aerosolized drugs; observe the effects of drugs and initiate preventive or emergency action. In addition, observation skills for evaluating a patient's response during a treatment is very important. To accomplish this, knowledge is required to determine drug interactions, evaluate various patient response to drugs and identify problems associated with their administration.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select appropriate nebulizer.

3) Prepare/retest nebulizer.

4) Prepare/position patient for therapy.

5) Add prescribed medication to nebulizer.

6) Implement treatment.

7) Assess patient response.

8) Modify techniques to deal with adverse patient response.

9) Terminate treatment as prescribed.

10) Record therapy.

General Knowledge

The knowledge required is gross anatomy and physiology of the tracheobronchial tree, physics as applied to operation of nebulizers, and the flow of gases and behavior of aerosols. An understanding of general mathematics for computing dosages, basic principles of pharmacology, the categories and action of drugs used in respiratory therapy, and the techniques used in its administration is required. The Level II should be familiar with different types of respiratory diseases and situations where aerosol medications may be administered.

G. INFECTION CONTROL

Clinical Knowledge

A Level II must have basic knowledge in the prevention and spread of communicable diseases. He must understand aseptic techniques as necessary to protect himself, the patient and others against infection through proper hand care, use of a face mask, gowning techniques and the handling of contaminated equipment and linens. In addition, he must understand specific problems related to the handling of respiratory equipment under isolation.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select/prepare equipment.

3) Observe isolation procedure.

4) Implement isolation procedures.

General Knowledge

A Level II must have knowledge of pathogenic organisms and their modes of transmission. General knowledge required are fundamentals of microbiology and pathophysiology.

DELINEATION OF ROLES AND FUNCTIONS OF LEVEL III PERSONNEL

ENTRY LEVEL III PERSONNEL

The Level III must be able to perform Level II tasks in addition to tasks designated as Level III. He administers respiratory therapy under direct or indirect supervision of a physician or an experienced Level III.

The scope of patient care includes: continuous ventilation , airway maintenance, emergency care, pulmonary function testing, cardiorespiratory rehabilitation, infection control, isolation procedures and cardiorespiratory drug administration.

The Level II is capable of serving as a resource of knowledge to the physician in relation to the technical aspects of respiratory care and to the hospital staff as to effective and safe methods for administering respiratory therapy.

The Level III should have knowledge and skill necessary to administer respiratory therapy to patients of all ages with varied cardiorespiratory diseases.

A. CONTINUOUS VENTILATION

1. STANDARD PROCEDURE

Clinical Knowledge

A Level III should be able to apply ventilators to patients, monitor the patient's ventilatory status through the use of spirometers, pressure gauges and chest auscultation, and be aware of the indications, contraindications and possible hazards involved with continuous ventilation. He should have the ability to modify therapy techniques to deal with adverse patient response. To accomplish this, a knowledge of ventilators commonly used to provide continuous ventilation is required. Special skills associated with bedside monitoring of a patient's respiratory status include the drawing and analysis of arterial blood* and monitoring of the patient's respiratory exchange. Additional knowledge includes adjustment of respiratory therapy based on clinical and laboratory data and consultation with a physician. A knowledge of the weaning procedure for removing a patient from continuous ventilation is necessary.

* This procedure is subject to legal and regulatory statutes and hospital policy.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Prepare/retest ventilator.

3) Prepare/position patient.

4) Adjust controls.

5) Implement ventilation.

6) Activate electro-mechanical monitors.

7) Draw arterial blood sample and perform gas analysis*.

8) Determine cardiorespiratory status.

9) Add prescribed medication.

10) Assess patient response.

11) Modify therapy to deal with adverse patient response.

12) Maintain ventilator.

13) Evaluate effectiveness of ventilation.

14) Wean patient from ventilator when prescribed.

15) Record therapy.

Background Knowledge

The knowledge required to function proficiently includes anatomy, physiology, pathology and pathophysiology of the cardiorespiratory system. He must know fundamentals of biomedical electronics, mathematics, chemistry and psychology.

* If legal and regulatory statutes and hospital policy allow.

2. SPECIAL PROCEDURES

Clinical Knowledge

A Level III should know the application of special procedures involving continious positive pressure breathing (CPPB). He should be aware of indications, contraindications, and hazards of special procedures along with the modifications to be implemented in the event of unfavorable patient response such as a drop in blood pressure. He must have knowledge of equipment commonly used for applying these special procedures. He must also be familiar with the apparatus and procedures for testing its proper functioning prior to patient application. He should be able to interpret the results of blood gas studies and evaluate the effectiveness of the special procedures.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select equipment.

3) Prepare/retest equipment.

4) Prepare/position patient.

5) Implement CPPB.

6) Activate electro-mechanical monitors.

7) Assess patient response.

8) Modify technique to deal with adverse patient response.

9) Wean patient from ventilator when prescribed.

10) Record therapy.

Background Knowledge

The Level III administering special procedures must have knowledge of algebra, general chemistry, cardiorespiratory anatomy and physiology, acid-base physiology, medical physics, pathophysiology and pathology of cardiorespiratory diseases and disturbances.

B. AIRWAY CARE

1. TRACHEOBRONCHIAL ASPIRATION

Clinical Knowledge

A Level III performing tracheobronchial aspiration should be familiar with techniques for sterile collection of sputum, tracheal instillations and aspiration. He should have a knowledge of pharmacological actions of solutions to be instilled and physical and chemical characteristics of sputum. In addition, he should be aware of indications, contraindications and hazards associated with tracheobronchial aspiration.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select equipment.

3) Evaluate patency of airway.

4) Instill prescribed solution as indicated.

5) Prepare/retest equipment.

6) Prepare/position patient.

7) Hyperinflate and hyperoxygenate patient.

8) Implement aspiration procedures.

9) Evaluate characteristics of sputum.

10) Assess patient response.

11) Modify therapy techniques to deal with adverse patient response.

12) Record procedure.

Background Knowledge

A Level III should have knowledge of tracheobronchial airway anatomy, respiratory physiology and fundamentals of microbiology. He should also know the types of pathogenic organisms frequently encountered in the respiratory tract.

2. TRACHEOSTOMY CARE

Clinical Knowledge

A Level III must have clinical knowledge of indications, contraindications and hazards of cuffed and uncuffed tracheostomy tubes. In addition, he should understand emergency procedures for displacement of tracheostomy tubes and hemorrhage. He should be able to provide stoma and tracheostomy care.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select/prepare equipment.

3) Inflate or deflate cuff.

4) Implement tracheostomy tube and stoma care.

5) Change tracheostomy tube, except in a fresh tracheostomy.

6) Assess patient response.

7) Modify technique to deal with adverse patient response.

8) Record procedure.

Background Knowledge

Level III will know the physics of gas flow and anatomy and physiology of the cardiorespiratory system.

C. EMERGENCY CARE

Clinical Knowledge

Level III should be qualified to recognize and deal with respiratory failure through the use of electromechanical monitors and application of emergency equipment and supportive measures to prevent hypoxia. In addition, he should provide direct assistance to the physician in the management and support of cardiac resuscitation. A thorough knowledge of cardiopulmonary resuscitation and resuscitative equipment and techniques including intubation and electrical defibrillation is required.

Clinical Skills

1) Assess cardiorespiratory status.

2) Intubate the trachea*.

3) Defibrillate*.

4) Use all types of resuscitators.

5) Evaluate effectiveness of resuscitator.

6) Record resuscitative attempt.

* Subject to legal and regulatory statutes and hospital policy.

Background Knowledge

The background knowledge required to provide safe and comprehensive emergency care should include detailed anatomy of the head, trachea and thorax, general anatomy and physiology of the cardiorespiratory systems, acid-base physiology, physics as applied to electrical current movement and the operation of cardiopulmonary resuscitators and defibrillators, and pharmacology as applied to cardiorespiratory drugs.

D. INFECTION CONTROL (Culturing)

Clinical Knowledge

Level III should have knowledge of pathogenic organisms, proper techniques for obtaining a culture specimen, correct procedure for periodically sampling various types of respiratory therapy equipment, maintaining a culture log and proper recording of specimen data for future references. He should understand the clinical problems related to respiratory care and be able to suggest corrective actions to prevent further infection of noncontaminated respiratory equipment. He should be able to interpret clinical laboratory reports and anticipate infection problems.

Clinical Skills

1) Plan and implement culturing procedures.

2) Determine if corrective action is required.

3) Implement corrective action and assess results.

Background Knowledge

The Level III responsible for culturing respiratory therapy equipment should have knowledge of microbiology, pathology and pathophysiology of respiratory disease related to infection.

E. CARDIORESPIRATORY PHARMACOLOGY

Clinical Knowledge

The Level III must be able to administer drugs to critically ill patients, monitor their response by chest auscultation, interpret basic EKG interpretation and perform clinical observation based on a knowledge of drugs and their specific effect on various body systems. All above modalities, with the exception of emergency procedures, must be performed by prescription and, when indicated, under the direct supervision of a physician.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Select appropriate nebulizer.

3) Prepare/retest nebulizer.

4) Prepare/position patient for therapy.

5) Add prescribed medication to nebulizer.

6) Implement treatment.

7) Assess patient response.

8) Modify therapy procedure to deal with adverse patient response.

9) Terminate treatment as prescribed.

10) Record therapy.

Background Knowledge

The knowledge required includes a thorough understanding of pharmacology as pertaining to cardiorespiratory drugs, treatment techniques, pulmonary toxicology, anatomy and physiology, pathology and pathophysiology of diseases of the cardiopulmonary systems, communication and observation skills, monitoring techniques including basic electrocardiograph, advanced emergency procedures and special techniques involved with administering gas mixtures.

F. PULMONARY FUNCTION TESTING

Clinical Knowledge

Primarily, Level III will be involved in operation of spirometers and various flow measuring devices. He should be familiar with respiratory management of patients while performing pulmonary function tests and measurement of lung volumes, maximum voluntary ventilation, inspiratory flow rates, expiratory flow rates and functional residual capacities. Additional tests include measurement of timed vital capacity and maximum inspiratory and expiratory effort. He should be able to assess pulmonary response to cardiorespiratory medications and analyze and interpret arterial blood gases.

Clinical Skills

1) Read/evaluate physician's order for test.

2) Read/evaluate patient's chart.

3) Select/prepare equipment.

4) Observe safety precautions.

5) Prepare/position patient.

6) Implement test/assess patient performance.

7) Determine test results.

8) Compare test results with normal range values.

Background Knowledge

The Level III conducting pulmonary diagnostic tests must have a knowledge of algebra, general chemistry, medical physics, biomedical electronics, cardiorespiratory anatomy and pathophysiology and physiology, pharmacology and an in-depth understanding of pathology of cardiorespiratory diseases and disturbances.

G. CARDIORESPIRATORY REHABILITATION

Clinical Knowledge

The Level III will assist the physician by making suggestions regarding the patient's treatment and pulmonary progress as observed in the hospital and on home visits. He will instruct the patient and family in the use of equipment and techniques involved in self care. In addition, he will provide instruction so that the patient will understand the nature of his cardiorespiratory disease and its ramifications.

Clinical knowledge and skills involve independent decisions by Level III as to the capability of the respiratory therapy service to provide the treatment according to the physician's order and assessment of the patient's physical tolerance to the treatment as it is administered.

The Level III will develop individual exercise routines, bronchial clearing procedures, and evaluation and monitoring techniques for each patient. Proficiency must be achieved in the use of a stethoscope for determining breath sounds and identifying possible airway problems.

Clinical Skills

1) Read/evaluate physician's order and chart.

2) Prepare/position patient.

3) Instruct patient and family in breathing exercises and postural drainage procedures.

4) Implement cardiorespiratory exercises.

5) Instruct patient in proper use of respiratory therapy equipment in the home.

6) Assess patient response.

7) Modify techniques to deal with adverse patient response.

8) Activate electro-mechanical monitors.

9) Record procedure.

Background Knowledge

The background knowledge required includes anatomy and physiology of the heart and lungs, pathology and pathophysiology of chest diseases, basic radiographic and electrocardiographic skills involving the recognition of cardiopulmonary abnormalities. The Level III must have knowledge of body mechanics, patient positioning, techniques used to mobilize secretion, breathing instruction and supportive exercises. The abilito to understand the patient's psychosocial needs and communicate effectively is essential. He must have knowledge of respiratory therapy equipment designed for home care.

A DISCUSSION OF ROLES AND FUNCTIONS FOR LEVEL IV PERSONNEL

A DISCUSSION OF LEVEL IV

Level IV incorporates those tasks which require more background knowledge, a higher degree of skill and extensive clinical experience. In addition to Level III tasks, the Level IV will have to function in situations of unsupervised patient contact requiring great individual judgment. Level IV tasks represent advanced specialty skills in areas such as management, education and critical care. These areas represent expanded roles or functions as currently defined for respiratory therapy personnel. The tasks included in this part are identified as appropriate, and delineated in compliance with conditions of the contract.

Respiratory therapy personnel who advance professionally are usually promoted into areas of departmental management where the skills necessary to establish and maintain a high level of respiratory care most appropriately are identified as Level IV. The person who is responsible for management of a respiratory therapy service must be able to successfully manage the staff who perform respiratory care in the hospital. This requires different types of managerial skills which are delineated in this part.

The respiratory therapy educator can be most readily identified as Level IV because of his advanced academic degree and the great responsibility placed on him to set standards of knowledge, clinical skills and experience criteria for those who are training to enter various levels within the field. He must have a great personal wealth of knowledge, experience and clinical expertise. The educator must have ability to effectively teach students both in the classroom and at the patient's bedside. In addition, he must have managerial skills necessary to effectively organize a formal educational program, inservice training of respiratory therapy staff, and the training of other health personnel concerned with respiratory care. A detailed list of the roles and function of the educator may be found in this part.

An emerging specialty within the field of respiratory therapy is critical care medicine. Career mobility of Level III respiratory therapy personnel into areas of critical care medicine is quite natural and will become better defined as more people become more knowledgeable and experienced in cardiopulmonary support. At the present time respiratory therapy personnel have developed expertise in maintaining adequate ventilation and tissue oxygenation. The respiratory therapy person functioning at a Level IV has the capability of

providing cardiopulmonary rehabilitation and is able to physiologically monitor the patient's cardiopulmonary status. Level IV personnel responsibilities within the critical care unit may include: (1) the administration of respiratory care, (2) planning and supervision of pulmonary drainage, (3) collection and analysis of arterial and mixed venous blood, and (4) clinical assessment of the patient and operation of life support equipment.

Additional areas which lend themselves to career mobility in the very near future include: (1) anesthetic gas administration, (2) emergency medical care in the field, (3) biomedical instrumentation, (4) the operation hyperbaric chambers and (5) advanced/research cardiorespiratory diagnostic testing.

There are many areas which lend themselves to horizontal mobility. Some of the most current areas are cardiopulmonary pediatrics and heart-lung bypass. Respiratory therapy personnel who work in hospitals which require specialized training within these areas have responsibilities which are different than the average Level II or Level III person. A description of some of the roles and functions of these two specialized areas can be found in this part.

The project staff proposes that it is not possible, within the time limitations of Phase I, to thoroughly describe and delineate the various areas, specialties and subspecialties related to career mobility within the different Levels. The project staff submits, however, that it is appropriate for these areas to be developed in complete detail at a subsequent time.

A. MANAGERIAL SKILLS

1) Develop/maintain departmental policy manual.

2) Prepare/administer departmental budget.

3) Plan space requirements.

4) Establish inventory control of equipment and supplies.

5) Develop and review staff job descriptions.

6) Evaluate staff's work performance.

7) Develop/administer recruitment policies and procedures.

8) Interview prospective employees.

9) Establish equipment maintenance and service schedules.

10) Assist in development of hospital charge system.

11) Develop/administer departmental orientation procedures for new employees.

12) Develop/administer inservice education programs.

13) Develop/administer interdepartmental education programs.

14) Serve on intrahospital committees.

15) Utilize physician guidance in total departmental plan of operation.

B. FORMAL/ACADEMIC RESPIRATORY THERAPY EDUCATION

1) Teach effectively in classroom.

2) Teach effectively at the bedside of in a hospital environment.

3) Develop teaching materials.

4) Plan, develop and review the curriculum of the educational program.

5) Administration of the admissions process.

6) Supervise maintenance of student records.

7) Organize student counseling.

8) Schedule classroom space.

9) Supervise didactic and clinical instruction.

10) Plan long and short term goals and objectives.

11) Establish and maintain clinical affiliations.

12) Evaluate didactic and clinical instruction.

13) Recruit and interview applicants for faculty appointments.

14) Prepare/administer the budget.

15) Utilize physician direction in total program plan of operation.

C. HEART LUNG BYPASS

1) Understand theory/practices of pump operation.

2) Adhere strictly to operating room aseptic techniques.

3) Recognize complications of pump techniques.

4) Assemble/test pump for proper function.

5) Assemble/test oxygenator for proper function.

6) Attach all appropriate pump connections.

7) Prime pump with appropriate solutions.

8) Activate/test emergency and alarm devices.

9) Check system carefully for leaks.

10) Observe/evaluate performance of total pump/oxygenator system.

11) Regulate solution temperature and medical gas mixture.

12) Adjust fluids/solutions to desired blood chemistry.

13) Prepare to pass circuit to surgical table.

14) Follow surgeon's instructions.

15) Activate pump/oxygenator when directed.

16) Monitor pump controls and adjust as necessary.

17) Terminate procedure as directed by surgeon.

18) Utilize physician direction in carrying out procedure.

D. CARDIOPULMONARY PEDIATRICS

Newborn infants who have various abnormalities are prone to develop cardiorespiratory depression very quickly after an apparently normal delivery. A Level II or III person would be required to aid and/or resuscitate these patients in the absence of an attending physician, using various equipment and techniques such as intubation, cardiopulmonary resuscitation and continuous ventilation. A Level IV can be utilized to supervise and instruct on neonate rescusitation.

APPENDIX

OFFICIAL DEFINITION OF RESPIRATORY THERAPY

The following is the official definition of respiratory therapy as approved by the Board of Directors of the American Association for Respiratory Therapy in March 1969.

Respiratory Therapy is an allied health specialty employed in the treatment, management, control, and care of patients with deficiencies and abnormalities associated with respiration.

It shall mean the therapeutic use of medical gases, air, and oxygen administering apparatus, environmental control systems, humidification and aerosols, drugs and medications, ventilatory assistance and ventilatory control, postural drainage, chest physiotherapy and breathing exercise, respiratory rehabilitation, the assistance with cardiopulmonary resuscitation, and maintenance of natural, artificial and mechanical airways.

Specific testing techniques can be employed in Respiratory Therapy to assist in diagnoses, monitoring, treatment, and research. This shall be understood to include measurement of ventilatory volumes, pressure and flows, and blood gas analyses.

Since Respiratory Therapy as a special health area is broadly defined and parallels closely other professional areas, it is important to realize that such therapy does interrelate in patient care performed by nurses, physical therapists and other technologists.

GLOSSARY

The following is a Glossary of terms commonly used to describe clinical skills delineated within this document. Its purpose is to unify definition of terms and promote clarity of meaning.

ADJUST CONTROL

setting knobs, switches, gas mixtures, etc. used in operation of the unit

ASSESS PATIENT RESPONSE

monitoring

measuring vital signs

auscultation

interpretation of laboratory values

assessment of patient response to treatment

DIRECT SUPERVISION

physical presence of individual at therapy site

ELECTRO-MECHANICAL MONITORS

EKG

spirometer

alarm

other support equipment

IMPLEMENT

adjust machine

connect machine to patient

make initial corrections

INDIRECT SUPERVISION

direction of individual from a far through pre-established procedures

MAINTAIN

routine service of a piece of equipment while in operation on a patient to insure effective and continued operation

MODIFY THERAPY TECHNIQUES TO DEAL WITH ADVERSE PATIENT RESPONSE

assessment of patient's clinical condition

judgment and action taken to deal with the situation

PREPARE/POSITION

initial assessment of patient by Level II or III; i.e. vital signs, auscultation, etc.

establishing rapport

explanation of procedure to patient

PREPARE/RETEST (at bedside)

attachment of machine to power source as prepared and tested in the department

adjustment of machine

re-evaluation of mechanical function

READ/EVALUATE PHYSICIAN'S ORDER AND CHART

determining completeness of prescription

ability of staff to deliver prescription

patient's physical tolerance to prescription at time of treatment

review of patient's chart for clinical history and related previous treatment